

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

1. (currently amended) A record medium for recording a program that causes an information apparatus to accomplish a multi-dimensional Fourier parallel processing method for a shared memory type scalar parallel computer having a plurality of processors, the method comprising:

(a) dividing multi-dimensional data to be Fourier transformed into a plurality of two-dimensional data elements corresponding to the number of the processors and storing the divided two-dimensional data elements ~~into~~ secondary cache memories of the processors, the two-dimensional data consists of first and second dimensions of the multi-dimensional data, and storing the two-dimensional data elements into the secondary cache memory of the processors for two-dimensional data elements in turn until all the two-dimensional Fourier transforms in step (b) are finished;

(b) causing each of the processors to two-dimensionally Fourier transform the two-dimensional data elements stored in the relevant secondary cache memory; and

(c) when necessary to perform a Fourier transform of remaining dimensions of the multi-dimensional data ~~repeating the step (b) a required number of times and when necessary,~~ assigning the remaining one-dimensional data elements to each of the processors and causing each of the processors to one-dimensionally Fourier transform the one-dimensional data elements.

2. (currently amended) The record medium as set forth in claim 1,
wherein the step (b) is performed by causing each of the processors to bind a plurality of vectors of the ~~secondary~~ second cache memory in a particular dimensional direction, copy the bound vectors to a relevant primary cache memory, and successively two-dimensionally Fourier transform the bound vectors.

3. (original) The record medium as set forth in claim 1,
wherein the multi-dimensional Fourier transform is a three-dimensional Fourier transform.

4. (currently amended) A multi-dimensional Fourier parallel processing method for a shared memory type scalar parallel computer having a plurality of processors, the method comprising:

(a) dividing multi-dimensional data to be Fourier transformed into a plurality of two-dimensional data elements corresponding to the number of the processors and storing the divided two-dimensional data elements ~~into~~ the secondary cache memories of the processors, the two-dimensional data consists of first and second dimensions of the multi-dimensional data, and storing the two-dimensional data elements into secondary cache memory of the processors for two-dimensional data elements in turn until all the two-dimensional Fourier transforms in step (b) are finished;

(b) causing each of the processors to two-dimensionally Fourier transform the two-dimensional data elements stored in the relevant secondary cache memory; and

(c) when necessary to perform a Fourier transform of remaining dimensions of the multi-dimensional data ~~repeating the step (b) a required number of times and when necessary~~ assigning the remaining one-dimensional data elements to each of the processors and causing each of the processors to one-dimensionally Fourier transform the one-dimensional data elements.

5. (original) A multi-dimensional Fourier parallel processing apparatus for a shared memory type scalar parallel computer having a plurality of processors, the apparatus comprising:

a dividing unit dividing multi-dimensional data to be Fourier transformed into a plurality of two-dimensional data elements corresponding to the number of the processors and storing the divided two-dimensional data elements to secondary cache memories of the processors;

a two-dimensional Fourier transform unit causing each of the processors to two-dimensionally Fourier transform the two-dimensional data elements stored in the relevant secondary cache memory until the Fourier transform of the two dimensional data elements is finished; and

a one-dimensional Fourier transform unit repeating the two-dimensional Fourier transform a required number of times and when necessary by ~~assigning the~~ remaining one-dimensional data elements of the multidimensional data to each of the processors and causing each of the processors to one-dimensionally Fourier transform the one-dimensional data elements.

6. (new) A Fourier transform process for data having at least three dimensions, comprising:

dividing the data into processing thread groups along the third dimension with the number of thread groups corresponding to a number of processors;

performing, in cache memory of corresponding processors, a two dimensional Fourier transform of the data in each of the thread groups;

transferring transform results to shared memory; and

performing, in the processors, a Fourier transform in the third dimension by accessing the results in the shared memory.